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(54) Abstract Title  
Proximity indication

(57) A mobile telecommunications device is used to notify a user of their proximity to a shop, event, person or other retailer outlet. User details are stored in a user database and retailer details including location are stored in a retailer database. A user leaves a notification request by accessing the retailer's web site and inputting notification criteria such as number of notifications, distance when notified and times of notification. The notification request is sent to a notification service. The position of the user is monitored using standard location detection techniques and correlated with the position of retailers or other parties for whom the user has placed a notification request. When the user is within the distance of the retailer or other party specified in the notification request the notification service provider sends a proximity message to the user. Alternatively intelligent household appliances such as a fridge can automatically send notification to a retailer of a product that needs replacing. The user is then notified when that they require a certain product when they are within range of a store selling the product.

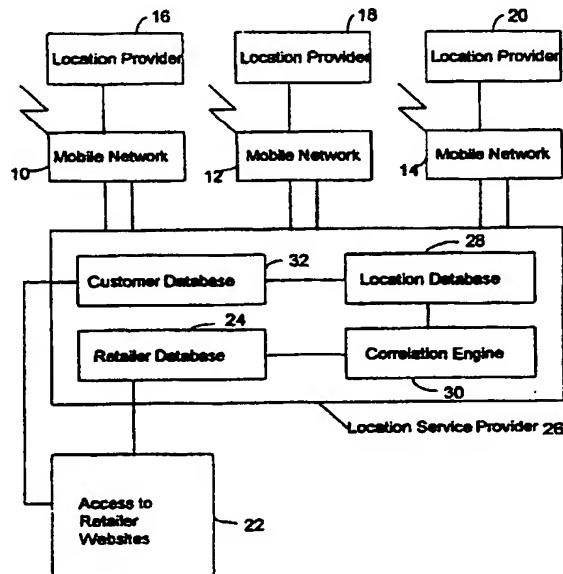


Figure 1

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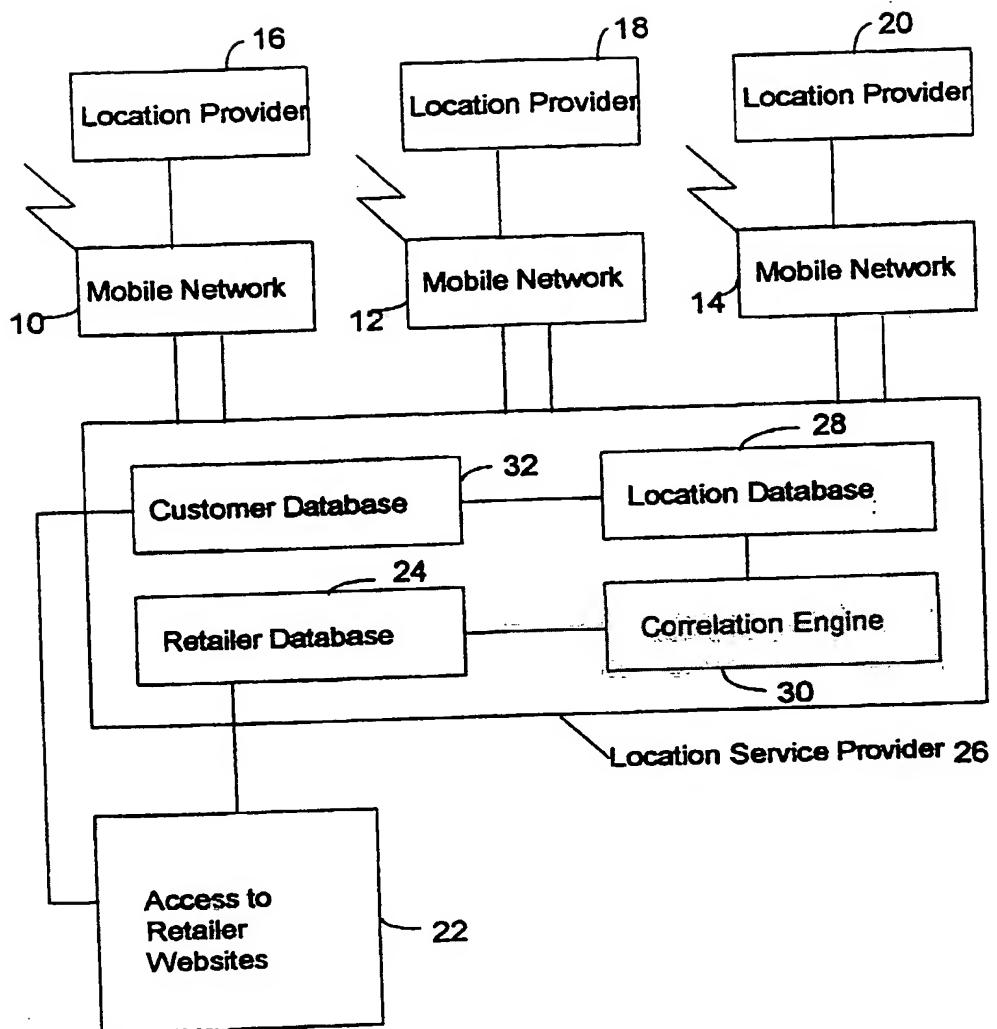


Figure 1

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## X Co Ltd Store Location

Please enter your name  
address

mobile telephone no  
e-mail

Please enter notification criteria  
notify me of

All Stores  
Stores in

London  
Manchester

How close do you want to be at notification?

100m  
400m  
1km

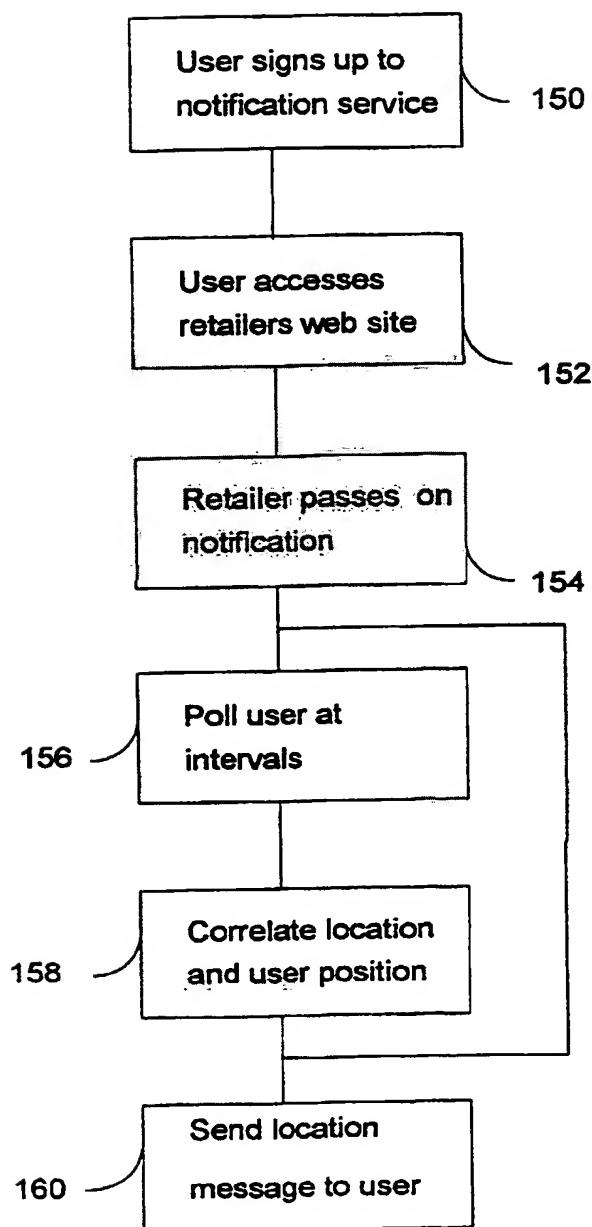


Figure 3

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**PROXIMITY INDICATION APPARATUS AND METHOD**

**FIELD OF THE INVENTION**

This invention relates to mobile communications apparatus and, more specifically to use of position location techniques to enhance mobile communication services.

**BACKGROUND TO THE INVENTION**

Techniques for locating the position of a mobile telephone handset are well known. It is relatively easy for a mobile telephone operator to tell within which cell a handset is located. However, cells are relatively large, especially in sparsely populated areas. In order to detect the location accurately, one of two techniques is normally used. The first uses a GPS receiver built into the handset such that position can be determined using the GPS (Global Positioning System) satellite network. The second relies on triangulation based on the relative distance of the handset from the base stations which define the cell within which the handset is located. In one example of this method triangulation is based on relative signal strength at each of the base stations.

Typically position location is contracted out by the service provider to a specialist organisation. In some countries local regulations require that the service provider must be able to determine position accurately, for example, to assist emergency services.

We have appreciated that positioning systems may be used to enhance greatly the services which can be offered to mobile telephone users.

**SUMMARY OF THE INVENTION**

The invention is the correlation of the location of a mobile communications device with a prestored location such as a shop.

5      More specifically there is provided a mobile communications system comprising:

            a plurality of user mobile communications devices;

            a mobile telecommunications network including

10     at least one location provider for determining the position of a given user mobile communications device;

            means for entering by a user details of a location about which the user wishes to be notified;

            means for correlating the position of the

15     mobile communications device with the location; and

            means for notifying the mobile communications device of its proximity to the location when the correlation means shows that the distance between the location and the mobile communications device is within a predetermined distance.

20     The invention also provides a method of notifying a mobile communications device of its proximity to a prestored location, comprising:

25     entering notification criteria relating to the prestored location;

            determining the position of the mobile communications device; correlating the position of the device with respect to the prestored location; and

            when the relative positions of the mobile communications device and the prestored location are within the notification criteria, notifying the mobile telecommunications device of the proximity of the location.

Preferably the notification comprises a message such as a text message sent to the mobile communications device.

Preferably the notification criteria are entered by accessing a web site associated with the location. The 5 notification criteria may include one or more of the distance from the location, number of times the user is to be notified and times of day during notifications may be made.

10 Preferably the notification criteria are sent from a web site associated with the location to a database of notification criteria entered from a number of communications devices. The positions of a number of communications devices are stored in a database and updated by periodic polling. The correlation means 15 correlates the position of each mobile communications device with the locations for which they have relevant notification criteria.

20 Embodiments of the invention have the advantage that users of mobile communications devices can be sent a message notifying them that they are within a predetermined distance of a location. Where that location is a shop 25 they may be notified of their proximity to any branch of that stop. Where the web site associated a location is that of a product manufacturer the notification may be made when the communications device is proximate any subscribing shop which stocks that product. Similarly the notification may be of proximity to an event such as a sports event or to a personal or office address.

30 In a preferred embodiment of the invention the notification criteria are sent from an intelligent household device such as a fridge and notify the communications device that a given commodity requires

replacing and that the handset is within a given distance of a shop that sells that commodity.

The invention further provides a mobile communications system comprising: a plurality of user mobile communications devices, a mobile telecommunications network including a location provider for determining the position of a given user mobile communications device, an intelligent domestic appliance for entering details of a location which sells a commodity which requires replacing, 5 means for correlating the position of the user mobile communications device with the location and means for notifying the user mobile communications device of its proximity to the location and the product to be replaced when the correlation means shows that the distance between 10 the location and the user mobile communications device is within a predetermined distance.

15

**BRIEF DESCRIPTION OF DRAWINGS**

Embodiments of the invention will now be described with reference to the accompanying drawings in which:

20 Figure 1 is a schematic block diagram showing a system embodying the invention;

Figure 2 is a representation of a screen into which notification details are entered; and

25 Figure 3 is a flow chart showing the major steps performed in operation of the system of figure 1.

**DESCRIPTION OF BEST MODE**

In essence the present invention utilises a combination of position location and third party web sites to enable a user of a mobile communications device such as a mobile

telephone to be notified when he is within range of a given location or event. A variety of different methods may be used to select the location or event and a variety of methods may be used to notify the mobile telephone 5 user.

Referring to figure 1, there is shown a number of Mobile Telephone Operators 10, 12, 14 each of which offer coverage over the same geographical area. Each of these service providers is operationally connected to a location 10 provider 16,18,20 which can provide, on request, the location of any mobile communications device connected to the service provider's network at any given time. The term mobile communications device refers to any device which can receive calls sent over a mobile communications 15 network. As well as covering mobile telephones it also includes personal digital assistants and other goods which incorporate mobile telephone receivers. As the system to be described does not require the user to make outgoing calls the term is not limited to devices which can both 20 receive and transmit. Location detection may be passive, in which case location is only determined on request, or active, in which case handsets are polled at intervals.

The purpose of the system is to draw users attention to locations or events in their vicinity. These include a 25 particular traders retail outlets, a shop selling a particular manufacturers goods and events such as cinemas and theatres, for example. Before a mobile telephone use can be notified, he must first express an interest in a given trader, product or event.

Interest is registered by the customer by accessing the 30 Internet web site of the goods or service provider, or a centralised web site displaying goods or services that have the location functionality. Figure 2 illustrates a portion of the web site which may be used to enable the

customer to supply the information necessary to be notified in due course. Thus, at 100 the customer supplies their personal details which include their name, address and mobile telephone number and could include 5 additional details such as e-mail address and demographic information such as age and family size. At 102 the customer supplies information as to the type of notification they require. Where the customer is to be notified that they are near a particular shop the customer will be asked whether they want to be notified when they 10 are near any branch of that shop and also the distance from which they wish to be notified. A customer who shops on foot will normally select a closer distance than a customer who travel by car. In some cases the customer 15 will be asked whether they want to be notified at all times of day. If the notification is for a shop the customer may elect not to be notified if they are near the shop when it is closed. If the notification is for a restaurant the customer my elect not to be notified outside normal meal times. If the notification is for an 20 event the customer may elect to be notified only if they are within a given period before the start time and then only if tickets are still available. It will be appreciated that the examples of notification criteria 25 described are far from exhaustive. Each goods or service provider mat tailor the notification criteria to suit the demands of their customers and the nature of the goods or services they provide.

Returning to figure 1, the customers access to the 30 Internet is represented schematically at 22. Each of the goods or service providers must first have registered for the location notification service and their details are stored in a retailer database 24. The term retailer is user herein to indicate any goods or service provider 35 including, not exclusively, retailers who have been selected for notification, retailers who carry product

lines of other manufacturers which have been selected for notification, restaurants, service providers and event promoters. The system need not be confined to commercial establishments but could be used for individual places such as homes and could be used by children or teenagers to identify parent's houses. The retailers database forms one part of the notification service provider 26 which also includes a customer database in which are stored the personal details of subscribers to the notification service including their name, address and mobile telephone number and the notifications to which they have signed up. The details are passed from the subscribing websites as they are entered by customers to the notification service provider. The notification service provider further includes a location database 28 which holds data provided from the location providers 18, 20, 22 regarding the location of subscribing customers at any given instant. In existing systems location detection may be active or passive. In the present embodiment of the invention it is required that the location detection is active with the customer handsets being polled at intervals to determine their location. The polling interval may vary but must be frequent enough for the notifications to be useful to the customer. For example if polling took place every 10 minutes this might be useless to a customer travelling at 60 mph in a car who may be 10 miles from a store by the time the notification had been received.

The location service provider further includes a correlation engine 30 which correlates data from the retailer database such as the location of a site and additional information entered into the notification criteria with position. When the correlation makes a match, that is a handset is within the specified notification criteria the notification service provider will send a notification message, via the customers mobile network operator to inform them of the proximity of the

goods or service provider. In one preferred embodiment of the invention the notification is a simple text message which may be displayed on any conventional mobile telephone. Alternatively, where the handset is a WAP Internet enabled handset, a map may be sent to the handset showing the position of the handset, the position of the goods or service provider and the route from one to the other.

Figure 3 illustrates the methodology behind the system described in the form of a flow chart. In the following description a number of retailers and goods and service providers are assumed to have subscribed to the notification service and details of retailer outlet locations are stored in the retailer database. At step 150, a user signs up to the notification service and inputs his profile into the notification providers database. The profile will include the user's name, mobile telephone number and the network to which he subscribes and may include other details such as billing information. At step 152, the user accesses the retailers web site and enters a notification request. At step 154 the retailer passes the notification request to the notification provider who stores it in the customer database alongside the profile for that customer. At step 156 the location of the customer is polled at regular intervals, the correlation engine attempts to make a match and, at step 158, when a match is made, the notification service provider sends a message to the user's handset via the user's mobile telephone network.

The embodiments of the invention described have the advantage that mobile telephone location technology can be used to assist mobile telephone users to locate shops, restaurants or events that are of interest to them. The system is operable using conventional mobile telephone networks and can be expanded as WAP enabled mobile phones

become more common. WAP enabled telephones can receive more sophisticated and more detailed information and may, for example send to a user a street map showing the exact location of the shop or details of special offers available to customers.

5 Embodiments of the invention may enable specific retail outlets, or chains of outlets to located by a user. They may also enable retail outlets that sell products or a specific product of a given manufacturer to be located.

10 They made be used to enable users to be notified of particular events, for example a cinema showing a particular film. The notifications may be set according to any parameter and may be a one off notification or a repetitive notification every time the user is within

15 range of the retail outlet.

20 In one further embodiment the user can define themselves or a place of their choosing such as a restaurant or home as the location to be notified. This can be advantageous in trying to meet people or in assisting people to find their way to a user's house or office.

25 In another embodiment of the invention intelligent household devices such as fridges can sent notification criteria automatically to the retailer database identifying a product which requires replacing and details of a shop from which it can be purchased. Thus the user is notified, when for example, he is within range of a supermarket, that he requires milk even though the user was unaware that he needed milk.

30 Many modifications are possible and will occur to those skilled in the art without departing from the spirit and scope of the invention which is defined solely by the claims appended hereto.

**Claims**

1. A mobile communications system comprising:  
a plurality of user mobile communications  
devices;  
5 a mobile telecommunications network including  
at least one location provider for determining the  
position of a given user mobile communication device;  
means for entering by a user details of a  
location about which the user wishes to be notified;  
10 means for correlating the position of the  
mobile communications device with the location; and  
means for notifying the mobile communications  
device of its proximity to the location when the  
correlation means shows that the distance between the  
15 location and the mobile communications device is within a  
predetermined distance.
2. A mobile communications system according to claim 1,  
wherein the location is a commercial organisation and  
means for entering details of a location comprises means  
for entering notification criteria into an Internet web  
20 site of the commercial organisation.
3. A mobile communications system according to claim 2,  
wherein the notification criteria include the proximity  
to the location at which notification occurs.
- 25 4. A mobile communications system according to claim 3,  
wherein the commercial organisation is a retail outlet or  
place of interest and the notification criteria includes  
proximity to the retail outlet or place of interest.
- 30 5 A mobile communications system according to claim 3,  
wherein the location is a product manufacturer and the

notification criteria includes proximity to a retail outlet at which the products are on sale.

6. A mobile communications system according to claim 3, wherein the location is an event and the notification criteria includes proximity to the location of the event and time until commencement of the event.

7. A mobile communications system according to claim 2, comprising a data base of locations connected to the correlation means to enable the correlation means to compare the location and the position of the user.

8. A mobile communications system according to claim 3, comprising a position database having stored therein the position of each of the plurality of user mobile communications devices, the position database being connected to the correlation means to enable the correlation means to correlate the positions of a number of said plurality of user mobile communications devices respectively with respect to a number of locations.

9. A mobile communications system according to claim 1, comprising a plurality of mobile telecommunications networks each having a respective location provider, wherein the plurality of mobile communications devices each subscribe to at least one of the mobile telecommunications networks and the correlation means are connected to each of the location providers, whereby the position of each mobile communication device is provided to the correlation means by the location provider of the mobile telecommunications network to which the user mobile communication device subscribes.

30 10. A mobile communications system according to claim 1,

wherein the means for notifying the mobile communications device includes means for notifying one or more further mobile communications devices.

11. A mobile communications system comprising:

5                   a plurality of user mobile communications devices;

                  a mobile telecommunications network including a location provider for determining the position of a given user mobile communications device;

10                an intelligent domestic appliance for entering details of a location which sells a commodity which requires replacing;

                  means for correlating the position of the user mobile communications device with the location; and

15                means for notifying the user mobile communications device of its proximity to the location and the product to be replaced when the correlation means shows that the distance between the location and the user mobile communications device is within a predetermined distance.

12. A method of notifying a mobile communications handset of its proximity to a prestored location, comprising:

25                entering notification criteria relating to the prestored location;

                  determining the position of the mobile communications device; correlating the position of the mobile communications device with respect to the prestored location; and

30                when the relative positions of the mobile communications device and the prestored location are within the notification criteria, notifying the mobile telecommunications device of the proximity of the location.

13. A method of notifying a mobile communications handset according to claim 12, wherein the notification to the mobile telecommunications device comprises sending a text message to the handset.

5 14. A method of notifying a mobile communications device according to claim 12 or 13, wherein the step of entering notification criteria comprises entering notification criteria into a web site relating to the location and transmitting the notification criteria from the location  
10 related web site to a notification criteria database together with the details of the location.

15. A method of notifying a mobile communications device according to claim 12, 13 or 14, wherein the step of determining the position of the mobile telecommunications  
15 device comprises periodically polling the mobile communications device.

16. A method of notifying a mobile communications device according to claim 15, comprises periodically polling a plurality of mobile communications devices and storing the positions of each mobile communications device in a position database.  
20

17. A method of notifying a mobile communications device according to claim 16, wherein a plurality of notification criteria are entered by a plurality of mobile  
25 communications device users each relating to a given location and stored in a database, wherein the respective positions of the notification criteria and the mobile communications devices to which they are relate are correlated, and a notification message is sent to the appropriate mobile communications device whenever a correlation is within the notification criteria.  
30

18. A method of notifying a mobile telecommunications device according to any of claims 13 to 17, wherein the step of entering notification criteria relating to the prestored location comprises an intelligent household appliance entering a notification that a product requires replacing together with the location of a shop from which it can be replaced.

5

19. A mobile communications system substantially as herein described with reference to the accompanying drawings.

10

20. A method of notifying a mobile communications handset substantially as herein described with reference to the accompanying drawings.



Application No: GB 0015000.3  
Claims searched: 1 to 20

Examiner: Glyn Hughes  
Date of search: 14 December 2000

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): H4L (LDPP)

Int Cl (Ed.7): H04Q 7/22

Other: Online: WPI, JAPIO, EPODOC

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
A, E	GB 2348777 A (MOTOROLA) see page 11 line 17 to page 12 line 2	-
A, E	WO 00/35216 A1 (SPOTCAST) see whole document	-

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

